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BULLETIN
GEORGIA ACADEMY OF SCIENCE

Volume VIII DECEMBER 1950 Number 3

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PRESIDENT'S MESSAGE

The spring meeting of the Academy is to be held at the University of Georgia as a part of the University's Sesquicentennial Celebration. We hope to have an outstanding meeting in order to add something to this outstanding occasion.

Recently I was asked by the President of the Academy of Science of one of our neighboring states, "What is the purpose of the Georgia Academy of Science?" I must admit that I had no ready answer. Even after some hesitation, all that I could think of was that its main purpose is, I thought, to arrange a meeting where the various scientists could come together to discuss their research and exchange ideas. I told him further that in recent years the Georgia Academy has sponsored a Junior Academy and that this work is now considered of considerable importance.

At that time I felt rather ashamed of being unable to give a better answer. However, even now I am unable to add to it. I believe that the matter is just that simple. It is the duty of the officers to arrange for the annual meeting. They must select the time and the place, see that the arrangements are ample and the program in order. They arrange the framework, but the spirit must come from the members.

Dr. W. B. Baker of Emory Uni-

versity heads a committee to raise money to finance the Junior Academy's Science Fair. The committee hopes to be able to make permanent arrangements for financing the Fair. This is a difficult job, and I feel sure that Dr. Baker will be glad to receive suggestions from other Academy members.

Cordially yours,

William M. Spicer

SECTION CHAIRMAN FOR THE 1951 MEETING

Biology Section: Dr. Arthur S. Cohen, Oglethorpe University.

Mathematics, Physics, and Engineering Section: Dr. Robert T. Lagemann, Emory University.

Chemistry Section: Dr. W. Joe Frierson, Agnes Scott College.

Earth Science Section: Dr. J. G. Lester, Emory University.

Psychology and Medicine: Dr. Joseph E. Moore, Georgia Tech.

ACADEMY NEWS

Membership in the Academy now totals 349. Recent increases in membership are largely the result of the continued and excellent work of the Membership Committee which has been active for more than a year.

Research funds available for members of the Academy from both the research funds of the A.A.A.S., and from the funds of the Academy now total a little more than $400.00. Applications for the use of any part of these funds should be sent in duplicate to the secretary who will refer them to the appropriate committee.

It has been hoped that local research could be reported in the Academy Bulletin, and the secretary is glad to have included in the present issue a report of recent research by Clyde E. Keeler and Luis Prieto.

Invitations for the 1951 meeting were received from President Blake Van Lear, the Georgia Institute of Technology, Wesleyan College, and the University of Georgia. The decision to hold the next annual meeting at the University of Georgia was largely influenced by the expressed hope of President O. C .Aderhold that the Academy might take part in the Sesquicentennial Celebration.

The following information has been received relative to the Junior Academy:

"Dr. Osbourne R. Quayle and Dr. Robert T. Lagemann who so ably represented the Senior Academy in Junior Academy last year have agreed to serve in this capacity again. There seems to be more than the usual interest and enthusiasm in the Junior Academy this year, so the Science Fair should be even better than usual."

A.S.E

The Caribe-Cuna Moon-Child: A Demonstration of Pigment-Gene Pleiotropy in Man

Clyde E. Keeler
Georgia State College for Women, Milledgeville, Georgia

and

Luis Prieto
Clinica Prieto, Panama, R.P.

(Accepted for publication September 12, 1950)

In 1941 one of us (C.E.K.) showed that certain genes, known to modify melanic pigmentation in the Norway rat, also bring alterations of morphology, physiology and psychosomatic behavior.[1,2] Since that time this phenomenon has been demonstrated in other mammals,[3] birds[4] and fish.[5]

Although pigment-gene pleiotropy will probably be identified someday in other human variations such as Albinos and Red Heads, it is realized that samples of these variations taken from such a group as the American population, present the great disadvantage of heterogeneous residual hereditary background, due to hybridity and diverse origin of different individuals composing the sample. Such heterogeneous residual hereditary backgrounds may be expected to obscure many developmental tendencies of the pigment genes in question, that would stand out distinctly on an inbred, residual hereditary background. Again, we cannot be certain that all variants in a Red Head sample, for instance, represent but one genetic entity.

The albinistic Caribe-Cuna Moon-Children, familiar to one of us (L.P.) as patients over a period of years, have the advantage of a high gene frequency within an inbred population, and therefore they would be expected to show pleiotropy distinctly if it is present. In addition, the Moon-Children undoubtedly represent a single genetic entity. These facts make the Moon-Children a genetically superior material in which to search for pigment-gene pleiotropy in man.

For the benefit of any persons who might misinterpret the findings of our present study, we desire to state that in no way whatsoever, is this an investigation of race problems or a comparison between races, but merely the study of a simply inherited, albinistic syndrome segregating in an inbred population.

During the summer of 1950 we have examined thirty-seven Moon-Children.

Measurement of height and weight show that the Moon-Children are slightly shorter and lighter than are normal Cuna Indians. Head shape of Moon-Children appears to be brachycephalic in a higher percentage than normal, but this has not been proven.

The skin in general lacks all pigment, is horribly blistered by short exposures to sunshine to which it also responds by producing scat-

tered blotches of pigment as in true albinos. The skin may develop benign tumorous growths in a few cases. The skin becomes much wrinkled by ten years of age, especially on the back of the neck, and this condition increases with age. The skin, from the age of about one and one-half years, is covered with severe sores, due to infection of wounds, abrasions, and insect bites. The skin is very dry. The lips are enlarged and protrude.

Head hair at birth is usually white, changing through tow, to a rich golden in youth, and then to light brown, or even reddish brown in middle life. We have hair samples for study, and although all the comparisons have not yet been made, it would appear that the diameter of the hair of the Moon-Child is smaller than that of normals. It blows about more freely in the breeze.

Although normal Cuna are very smooth skinned, the Moon-Children bear straight, white hair on their bodies which on the forearms and lower limbs may measure from one-fourth inch to one inch in length by the age of nine years. This amazing hair was found on the appendages of all thirty-seven specimens examined.

The eyes tend to be of the oriental type in which the eyelids are invisible when the eye is open, whereas this kind of eye is fairly rare among normal Cuna. Part of this tendency may be due to maintaining skin muscles about the eye tense in an attempt to shut out more light. The area about the eyes often appears swollen or enlarged. Eye color is a rich blue, a much deeper blue than seen in true albinos, with some black around the periphery and a yellow or buff band developing about the pupil at the age of six or seven years. Moon-Child eyes examined ranged from five months to sixty years of age. Moon-Child eyes are weak and lateral nystagmus is present at all intensities of light under which they were examined—even down to the dim twilight of the Cuna hut.

We have been unable to determine basal metabolisms, but the indications are that metabolic rates of Moon-Children are reduced. Some specific gravities have been taken on urine samples and these are very low. Ultra-violet spectrum analysis of urine samples shows some substance, probably a product of purine metabolism, to be reduced in quantity, or possibly missing entirely. Moon-Children do not appear to have an incidence of lung infection above normal, but they constantly carry colds of the nose, head, and throat. Readings were taken with a manual dynamometer which show the Moon-Children are reduced in strength in both males and females. They have a slow gait, and slow movements. The physical directors of four schools say that Moon-Children lack endurance in physical

contests. Because this lack of endurance is common knowledge, the town does not call upon them for heavy physical labor in community projects, and the home demands from them only the lightest of duties.

Moon-Children, according to the observation of one of us (L.P.), are slow in developing sexually. Among the females, menstruation begins later than normal and the breasts are smaller in general. Males are undersexed, and although tradition forbids them to marry, they never have been known to make advances or sex attacks as normal males would under the restrictions of a rigid town government that makes prostitution impossible, except in one or two of the fifty Cuna towns.

The voices of Moon-Children tend to be soft, and this is particularly noticeable in adult males.

The mentality of Moon-Children appears to be normal, and no less than fourteen of them have competed in formal school classes. The chiefs of two large Cuna towns, Ailigandi and Ustupo, as well as other residents, tell us that Moon-Children tend to be stubborn and hot-tempered. Most Moon-Children seldom smile, and when they do, their smile is usually feeble. They definitely lack expression in the face.

It is noteworthy that Moon-Children do not want to associate with each other, and at the age of twelve or thirteen (when the Moon-Child girls find their normally pigmented friends marrying and having babies, and Moon-Child boys realize that they cannot compete physically with other boys) they often cease to associate with normals and become non-social. This tendency appears to be due to their feeling of inferiority.

However, in spite of this tendency to solitude, Moon-Children may have a strong, personal determination to succeed. For example, one Moon-Child girl of twenty years who had not had a day of schooling previously, persisted through three weeks of night classes until she had learned pronetic reading better than those normals who had four weeks training. One Moon-Child of eleven years, finding that he could only squeeze eight kilos on the manual dynamometer, whereas his associates could squeeze twelve kilos, returned alone half-a-dozen times each day during four weeks, determined to better his record. Such persistence has allowed Moon-Children to become leaders in their community in spite of their physical handicap.

Previously, the inheritance of the Moon-Child variation was obscure, its occurrence being considered as the segregation of a Nordic blond gene in one instance and in another it was considered as sex-linked. Many Cuna believe the variation due to diet or to maternal impressions caused by the mother-to-be having gazed too frequently at the moon. From the data now available, there is no doubt but

that the Moon-Child gene is a simple recessive, unit-character, giving normal mendelian ratios. In simplex it produces lighter colored individuals than normal in many cases, and it appears to be either a higher allel of the albino gene or else a mutation at an independent locus.

Details of this work will be published in the future.

The authors wish to thank Dr. H. Heinmets for making the ultraviolet spectrum determinations on urine samples mentioned in this paper.

They are indebted to the Rockefeller Foundation for a grant-in-aid to the senior author which has made this study possible.

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